ENERGY AUDIT MODELS

TOPIC REPORT
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THE 12 ELEMENTS OF AN ENERGY AUDIT PROGRAMME

IMPLEMENTING INSTRUMENTS

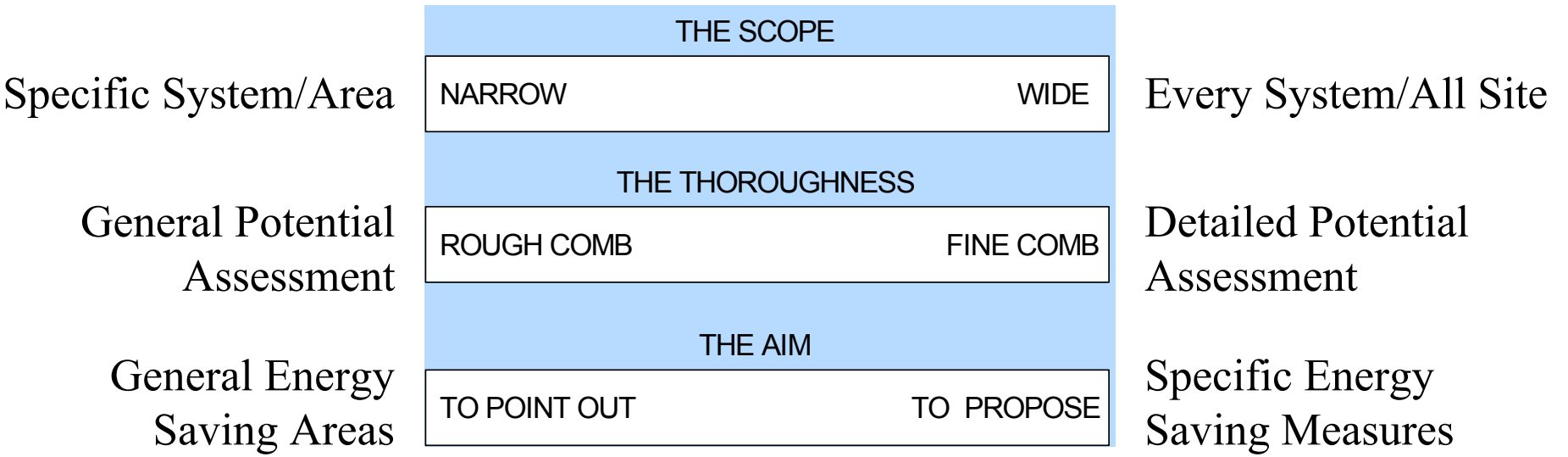
GOALS OF THE PROGRAMME	LEGISLATIVE FRAMEWORK	PROMOTION AND MARKETING	SUBSIDY POLICY
KEY PLAYERS	STRUCTURE OF ADMINISTRATION	MONITORING SYSTEM	**ENERGY AUDIT MODELS**
	TRAINING OF AUDITORS	AUTHORISATION OF AUDITORS	QUALITY CONTROL
	AUDITOR´S TOOLS		

DEFINING THE ENERGY AUDIT MODEL (EAM)

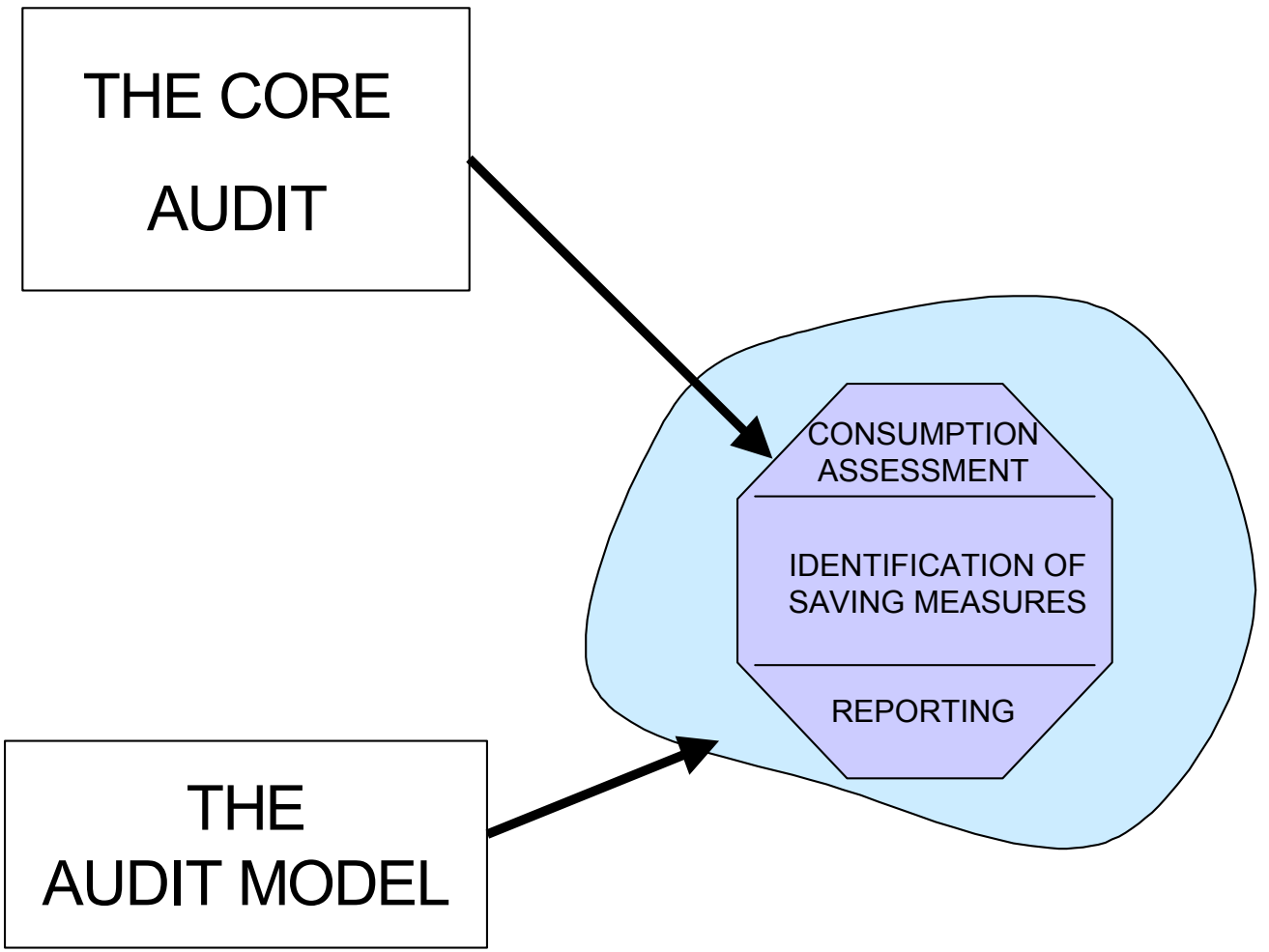
- The EAM is a public, standard and repeatable procedure for the performance of an energy audit service by specifying the scope, the thoroughness and the aim of the audit work

- The EAM is expressing the way of clustering the core energy audit characteristics, i.e., the assessment of site energy consumption, the identification of energy saving measures and the structured reporting of information

THE RANGE OF AUDIT WORK PROPERTIES IN EAMs



THE CLUSTER OF EAM AROUND THE CORE AUDIT



BASIC EAM OPTION 1 – SCANNING MODELS

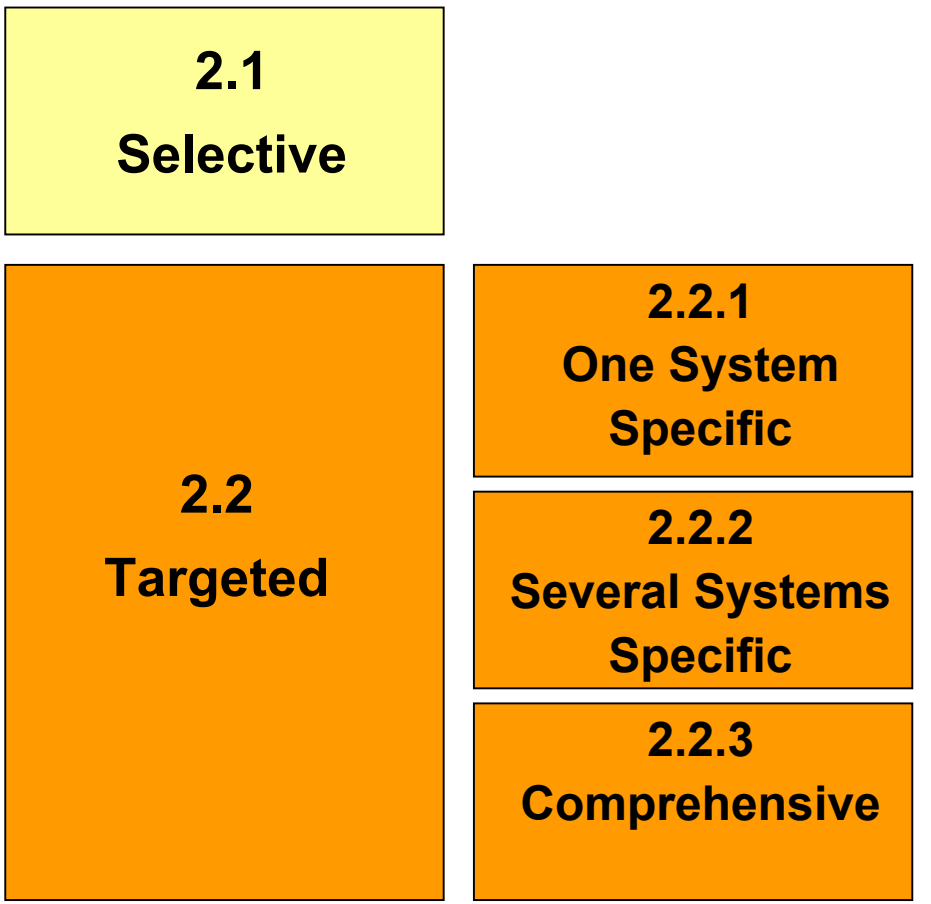
- POINT OUT JUST AREAS OF POSSIBLE SAVING MEASURES
- POINT OUT HOUSEKEEPING – NON IMPORTANT COST MEASURES
- ROUGH ASSESSMENT OF THE POINTED AREAS AND OF THE MEASURES POTENTIAL
- USUALLY LIMITED BUDGET AND REPORTING DETAIL
- VARIABLE TIME DEPENDING ON THE SITE SCALE

1.1
Walk Through

1.2
Preliminary

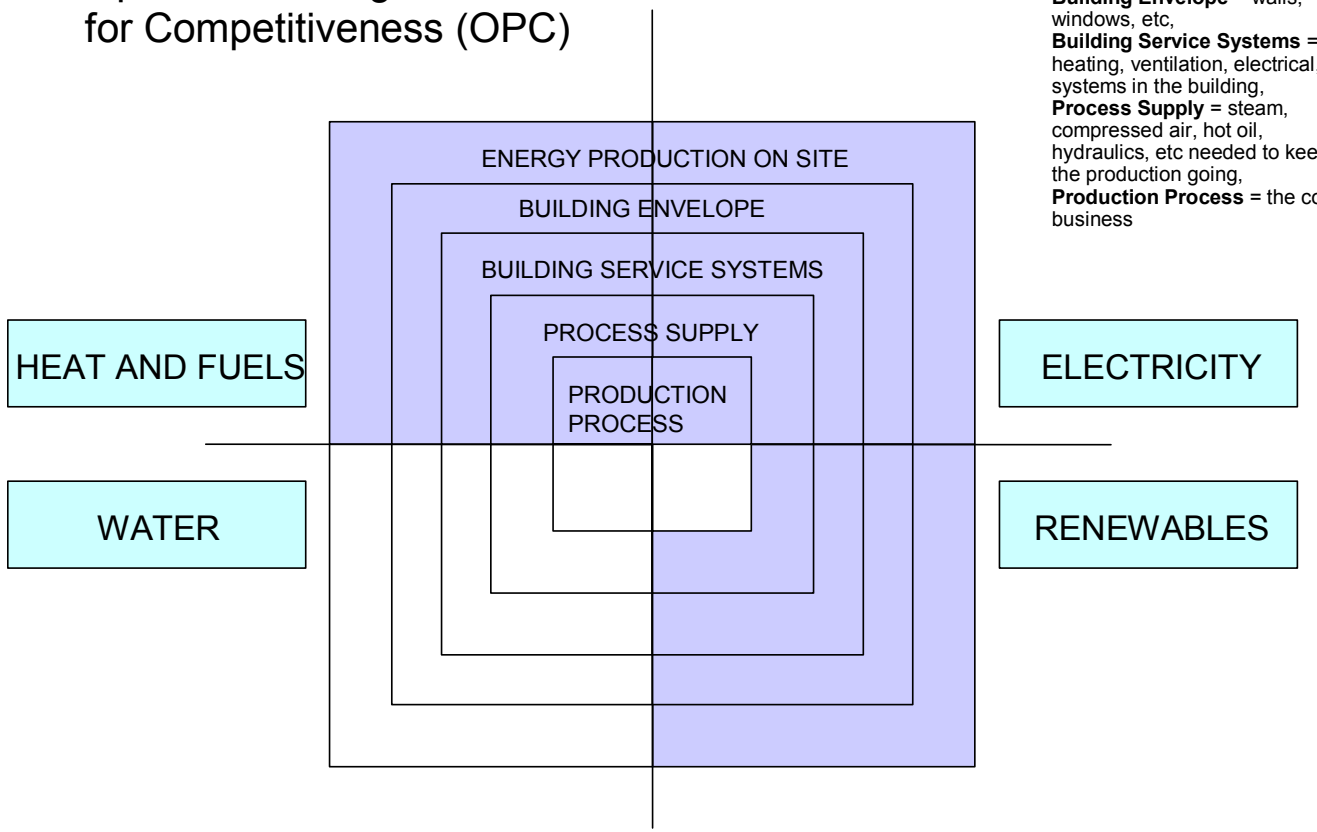
BASIC EAM OPTION 2 – ANALYSING MODELS

- PROPOSE IN DETAIL SPECIFIC COST ASSOCIATED SAVING MEASURES FOR THE ANALYSED ENERGY SYSTEMS
- THOROUGH ASSESSMENT OF THE ANALYSED ENERGY SYSTEMS AND OF MEASURES POTENTIAL
- USUALLY INCREASED BUDGET AND STANDARD DETAILED REPORTING
- VARIABLE TIME DEPENDING ON THE SYSTEMS SCALE



ENERGY AUDIT MODEL – THE MAP OF TARGET AREAS

GREECE:
Operational Programme
for Competitiveness (OPC)



EXPLANATION ON THE TITLES:

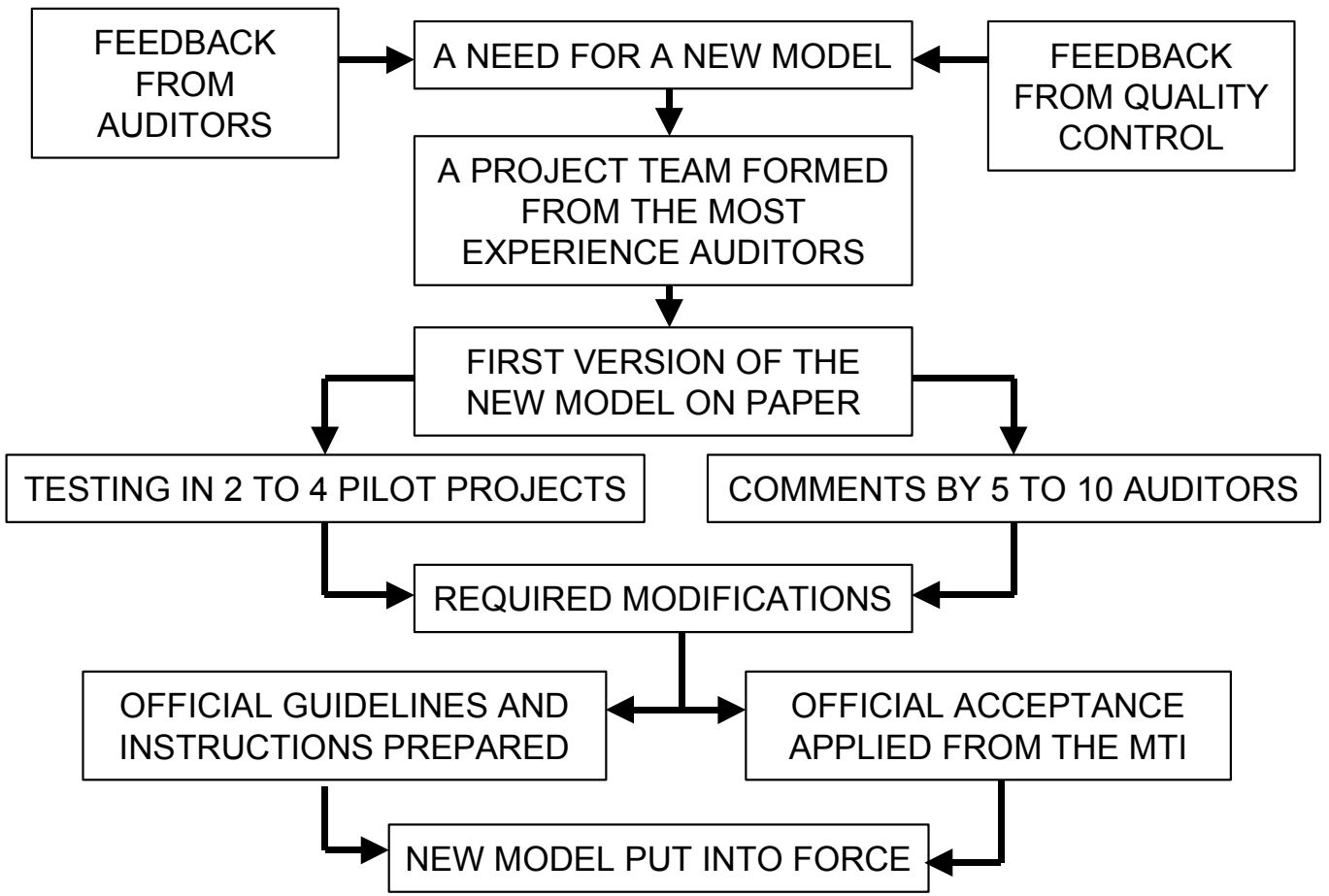
Energy Production on Site = the power & heat production for just the industrial site,
Building Envelope = walls, windows, etc,
Building Service Systems = heating, ventilation, electrical, etc systems in the building,
Process Supply = steam, compressed air, hot oil, hydraulics, etc needed to keep the production going,
Production Process = the core business

ADOPTING AN EAM

- SPECIFICATION OF OBJECTIVE METHODOLOGICAL STEPS FOR ENERGY AUDITING OF A TARGET GROUP WITHIN A PUBLIC PROGRAMME (EAP or OP)

- SETUP OF CLEAR REQUIREMENTS FOR THE AUDIT WORK INPUT & OUTPUT PARAMETERS, APPROPRIATE DATA & DELIVERABLES ASSOCIATED TO THE SPECIFIC TARGET GROUP

EAM DEVELOPMENT PROCESS – The Finnish EAP



PROGRAMME MANAGEMENT BENEFITS FROM EAMs

- COMPARABLE AND RELIABLE PERFORMANCE INDICES AND AUDIT RESULTS FOR LARGE TARGET GROUP VOLUMES
- INCREASED AUDIT WORK PRODUCTIVITY AND REPLICABILITY UNDER SPECIFIED APPLICATION FEATURES (Time, Cost, Phasing, Documentation)
- EFFICIENT QUALITY CONTROL OF AUDIT WORK DELIVERABLES
- TARGETED AUDITOR TRAINING ON A CERTAIN STEP PROCEDURE
- EASY ADAPTATION OF ANALYTICAL STEPS ACCORDING TO SPECIFIC TARGET GROUP AND AUDITOR NEEDS

THE APPLICATION FEATURES OF EAMs

COST (& TIME)

Connection to audit work compensation policy

a. Fixed cost (and/or time)

b. Project specific cost with a maximum limit

c. Project specific negotiated cost

d. Energy savings based cost

PHASES

Connection to step decision making agreements

a. Single-phase

b. Multi-Phase

REPORTING

Connection to EAM basic option

a. Light reporting

b. Savings - oriented reporting

c. Detailed technical reporting

IMPLEMENTATION

Connection to EAP Implementing Instruments

a. Mandatory

b. Recommended (optional)

EAM REPORTING Model Structure

The Finnish EAP

"BUILDING AUDIT" Comprehensive Analysing Option

Chapter 1
SUMMARY
3...6 pages

VERBAL DESCRIPTION
- Levels of energy and water consumption
- Explanations for existing consumption levels
- Saving potentials
- Description of saving measures

TABLES 1. and 2.
- Total figures: consumption, savings, investments
- List of measures with numerical data

Chapter 2
BASIC BUILDING DATA
3...6 pages

BUILDING DATA
- Location, type, size

CONNECTIONS
- Heat, electricity, water

ENERGY AND WATER CONSUMPTIONS
- Historical data, tariffs, cost breakdown and analysis

MAINTENANCE AND OPERATION
- Maintenance organization and contracts
- Energy and water monitoring system

Chapter 3
BASIC DATA ON HVAC & ELECT. SYST.
10...20 pages

DESCRIPTION BY SYSTEM
- Technical description of a system
- Evaluation of system´s energy efficiency
- Evaluation of system´s operational condition

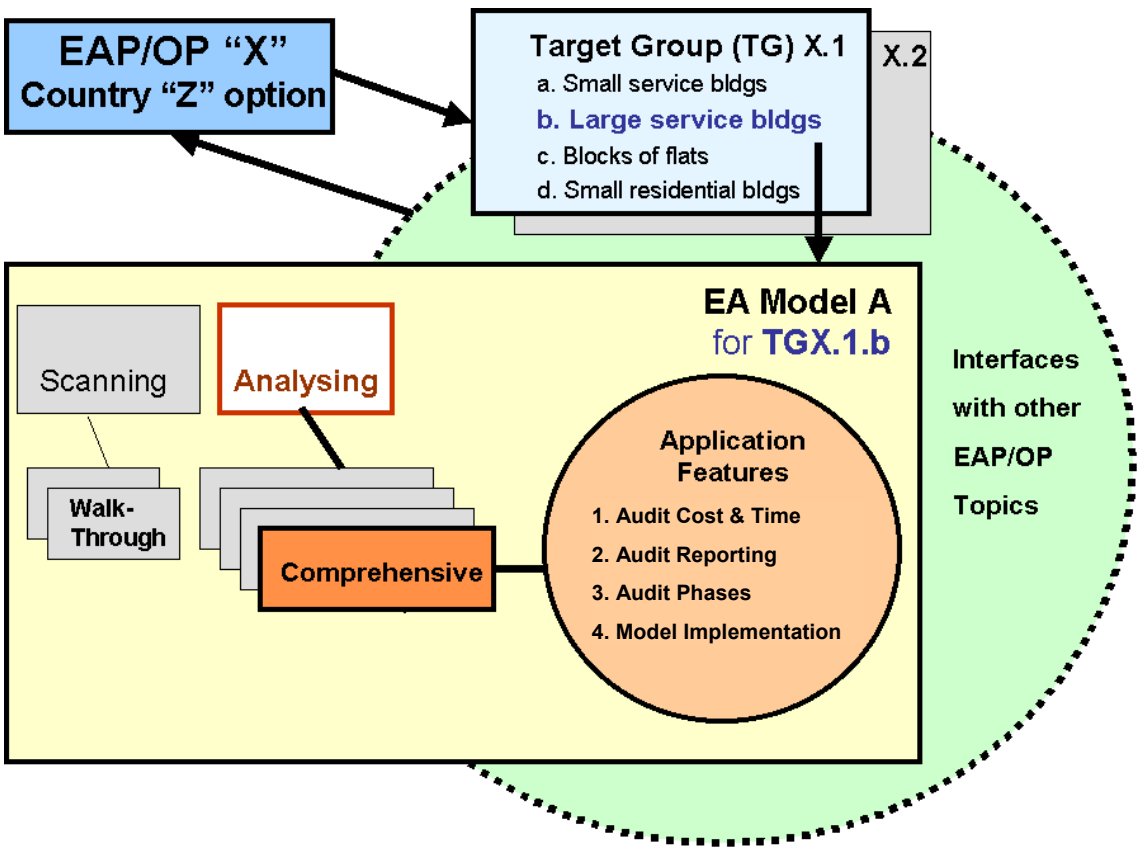
Chapter 4
ENERGY SAVING MEASURES
3...10 pages

DESCRIPTION BY SYSTEM
- Technical description of the proposed measure
- Calculated savings with initial data
- Calculated investments with initial data

Appendix

SUPPLEMENTARY INFORMATION
- Numerical tables and equipment data
- Pictures, charts and other graphical outputs

THE PATH OF PRACTICAL EAM APPLICATION OPTIONS



RECOMMENDATIONS

- Modelling of energy audits is not an easy task.

- If the procedural guidelines are too general, the EAM has no effect

- If the procedural guidelines are too detailed the EAM would not fit in certain cases.

RECOMMENDATIONS

•A small number of available expert auditors and an heterogeneous audit target group (e.g. industry process audits), should lead EAP management to the issue of just general guidelines to allow the use of selective and cost-effective auditor expertise

•A large number of available auditors, of different background and an homogeneous audit target group (e.g. small building audits), should lead EAP management to the issue of explicit detailed guidelines to achieve objective and comparable results, i.e.audit work quality.

RECOMMENDATIONS

•The development of a new EAM should be a result of continuous feedback received from the field reporting procedures – Quality Control.

•The length of the development phase of a new EAM could be one (1) year

•Every new EAM should be tested in several pilot projects before being issued

• Once a new EA-model is released, the first submitted audit reports should be evaluated to ensure that the set requirements are met.

•Even the most experienced auditors may have difficulties adapting a new EAM.

RECOMMENDATIONS

EAM options and features is a Learning-By-Doing iterative process

Programme developers have to decide how many EAMs are needed and how detailed specifications are needed

General EAM at the EU Level – Need for OAN Network